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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/863,487	05/23/2001	Jens Wildhagen	450117-03309	9332

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EXAMINER	
DEPPE, BETSY LEE	
ART UNIT	**PAPER NUMBER**
2637	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/863,487	WILDHAGEN, JENS	
	Examiner	Art Unit	
	Betsy L. Deppe	2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11/8/04 and 5/22/01, respectively* is/are: a)☒ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed November 8, 2004 have been fully considered but they are not persuasive.

2. In response to applicant's argument that the references do not teach a polyphase filter that "increases a number of Intermediate Frequencies utilized in selecting the sampling frequency" (see page 14 of the remarks), it is implicit that the circuit disclosed by Kale et al. in view of Bolle increases a number of Intermediate Frequencies utilized in selecting the sampling frequency because they are functionally equivalent.

Drawings

3. The drawings were received on November 8, 2004. These drawings are accepted.

4. The drawings are objected to because :

   a. the description of Figure 2a appears to correspond to the figure shown in Figure 2b and vice versa. For example, page 4, lines 35-38 describes Fig. **2a** as having delay elements with a delay T while Fig. **2b** shows the delay element with a delay T. Fig. 2a shows delay elements with a delay of "NT."

b. According to page 8, line 1, Figure 4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

c. In Figure 9, the Examiner suggests showing "t(k)" as the input signal to the circuit (see page 14, lines 11-15) for clarification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities:

on page 6, line 13, "order N" should be "delay NT";

on page 7, lines 20 and 23, "N" should be "NT" in order to be consistent with Figure 1; and

on page 9, line 5, N" should be "NT" in order to be consistent with Figure 3.

Appropriate correction is required.

Claim Objections

6. The claims are objected to because of the following informalities:

in claim 1, line 12, "sampling frequency" should be "sampling rate" (see line 6);

in claim 3, line 12, "said first subtracter" should be "said ***calculated difference*** of the first subtracter" (see claim 3, line 11);

in claim 3, line 15, the Examiner suggests changing "in case" to "if";

in claim 4, line 11, "said second subtracter" should be "said ***calculated difference*** of the second subtracter" (see claim 4, line 10);

in claim 4, line 14, the Examiner suggests changing "in case" to "if";

in claim 9, line 1, "An" should be "The";

in claim 9, line 2, ""N" should be inserted before "branch" (see claim 8, line 6); and

in claim 10, line 1, "An" should be "The."

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 3-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

10. With regard to claims 3 and 4, the specification does not describe a polyphase filter comprising an allpass filter (see claim 1, line 4) in combination with the limitations recited in claims 3 and 4, respectively. Based on the Examiner's understanding of the detailed description, allpass filter is the polyphase filter and the limitations in claims 3 and 4 ***comprise*** the allpass/polyphase filter. Therefore, the specification does not describe how to make and/or use a polyphase filter with the recited allpass filter in claim 1 ***and*** the separate additional limitations in claims 3 and 4.

11. With regard to claims 5 and 6, the specification does not describe "***each*** of said at least one multiplier" (*emphasis added*) comprising the recited limitations in the respective claims. However, the description of Figure 9 on page 13, lines 30-32

indicates that the configuration of the shift registers, adders and subtracters are used to replace both multipliers 5 and 9. Therefore, it is unclear how to make and/or use the claimed invention of each multiplier having a corresponding set of shift registers, adders and subtracters, as recited in claims 5 and 6.

12. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13. With regard to claims 1-7, the replacement of the delay element elements with the delay of 1 on lines 5-7 of claim 1 renders the respective claims vague and indefinite. If the claimed invention includes delay elements with delay of N, then "delay of 1" on line 1 should be changed to "delay of N" and the replacing language should be deleted.

14. Claim 1 recites the limitation "the sampling frequency" in line 12. There is insufficient antecedent basis for this limitation in the claim. The respective dependent claims are rejected for the same reason.

15. In claim 1, it is unclear what is meant by "said polyphase filter increases a number of Intermediate Frequencies (IF) utilized in selecting the sampling frequency." For example, it is unclear how the intermediate frequencies relate to the other limitations in the claim. It is also unclear how the intermediate frequencies affect the sampling frequency. The respective dependent claims are rejected for the same reason.

16. In claims 3 and 4, it is unclear what is meant by "builds" on lines 15 and 14, respectively. It is unclear how the output signal is built.

17. In claim 7, it is unclear what is meant by the recited limitation. For example, what is meant by "realized in a time multiplex?" Furthermore, how does clock frequency f_c "work" or interface with the polyphase filter.

18. With regards to claims 8-10, the equation for A(k) (see claim 8, lines 4; claim 9, line 5; and claim 10, line 2) is inconsistent with that shown in equation (24) on page 12. Equation (24) shows "floor(k/N)" as a superscript while the respective claims do not.

Claim Rejections - 35 USC § 102

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

20. Claims 1 and 3 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by the admitted prior art shown in Figure 2a of the instant application.

Claim Rejections - 35 USC § 103

21. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

22. Claims 1-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kale et al. ("High Resolution Data Conversion via Sigma-Delta Modulators and Polyphase Filters: A Review" cited in the IDS filed May 23, 2001) in view of Bolle (DB 2,282,303 A cited in the Office Action mailed August 3, 2004)

23. Regarding claim 1, Kale et al. teach all the claimed limitations of claim 1 " a structure...at least one multiplier" in claim 1 as follows. The allpass filter of order x is shown in figures 8(a) and 8(b), where x is interpreted to be 1 for figure 8(a) and 2 for figure 8(b) on page 166. The at least one multiplier is shown in figures 8(a) and 8(b). Additionally, the phrase "a sampling rate $f_{s'} = f_s/N$, with f_s being the sampling rate of the input signal (t(k))" is interpreted to mean the allpass filter operates at a rate equal to f_s/N. Kale et al. fails to teach the allpass filter operating at the rate of f_s/N, however, Kale et al. teach the allpass filter can be used for a plurality of data conversion processes, note page 165, left column, lines 35-38.

Bolle teaches an implementation of a polyphase allpass filter as a complex baseband converter. The polyphase allpass filter is clocked at a frequency = F/N, where F is rate at which data is sampled, note Fig. 1, elements 1 and 13, and N is the number of filters connected in parallel, note page 5, lines 12-14.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to implement Kale et al.'s allpass filter building blocks as Bolle's polyphase filter, since Bolle suggest, on page 3, lines 1-3, that the use of all-pass filters as a polyphase filter would be well suited to this type of signal processing. Although Kale et al. in view of Bolle does not explicitly teach increasing "a number of

Intermediate Frequencies utilized in selecting the sampling frequency," it is implicit since the circuit disclosed by Kale et al. in view of Bolle reads on the claimed invention and would be functionally equivalent.

24. Regarding claim 2, Kale et al. further teach the claimed subject matter "coefficients" in Fig 8(b) elements c1 and c2.

25. Regarding claim 3, Kale et al. further teach the claimed subject matter "a first delay element...in case x" as follows. The first and second delay elements are shown in figure 8(a), where N is equal to 2. The first adder is shown receiving input of the first delay element. The first subtractor is shown receiving input of the second delay element. The first multiplier is shown receiving coefficient c_1 as input.

26. Regarding claim 4, Kale et al. further teach the claimed subject matter "a second adder...in case x" as follows. The third delay element is shown in figure 8(b), where N is equal to 4. The second adder is shown receiving input from second multiplier. The second subtractor is shown receiving input of the third delay element. The second multiplier is shown receiving coefficient c_2 as input.

27. Regarding claim 7, Bolle further teaches the claimed subject matter "Time multiplex" and "clock frequency" in figure 1, elements 4, 5 and 7.

28. Claims 2 and 7 are also rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art as applied to claim 1 above, and further in view of Kot (US Patent No. 6,134,569). The admitted prior in Figure 2a of the instant application discloses the claimed invention except for time division multiplexed coefficients. Figure

1 of Kot teaches providing time division multiplexed coefficients to a polyphase filter. (See column 3, line 53 - column 4, line 22) It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings if Kot with that of the admitted prior art in order to efficiently implement a polyphase filter of a given length. (See Kot, column 4, lines 11-13)

29. Claim 4 is also rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in the instant application in view of Chu (US Patent No. 6,531,969 B2). Figure 4 in the instant application shows the claimed invention except for each delay element having delay of N. Figure 2a shows using a delay of N. Since Chu teaches using a FIR filter to resample a signal (see Figure 3 and column 4, lines 17-37), it would have been obvious matter of design choice to one of ordinary skill in the art at the time the invention was made to vary the delay to achieve the desired sampling rate. The desired sampling rate depends on the system considerations.

30. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in Figure 2a in view Kot as applied to claim 2 above, and further in view of Wilson et al. (US Patent No. 5,657,261). The admitted prior in Figure 2a of the instant application in view of Kot discloses the claimed invention including implementing the multiplier using at least one shift register, at least one adder or at least one subtracter. (See Kot, 60 and 70 in Figure 1) However, the cited references do not disclose using quantized coefficients.

Wilson et al. teaches using quantized coefficients to reduce the number of bits in a filter. (See column 4, lines 1-5) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use quantized coefficients in the circuit disclosed by the admitted prior art in view of Kot in order to reduce the size of the circuit by reducing the number of bits.

Conclusion

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Camp et al. (US Patent No. 5,592,517) discloses implementing polyphase filters using shift registers, adders, subtractors and switches.

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betsy L. Deppe whose telephone number is (571) 272-3054. The examiner can normally be reached on Monday, Tuesday and Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272 - 2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Betsy L. Deppe
Primary Examiner
Art Unit 2637

Sony International (Europe) GmbH

Accepted
BSD
8/18/05

REPLACEMENT SHEET

Figure 2a (PRIOR ART)